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| 09/659,590 | 09/11/2000 | Simon C. Borst | 2925-0283P | 4495 |

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| EXAMINER | |
|---|---|
| MACE, BRAD THOMAS | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2663 | 5 |

DATE MAILED: 07/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/659,590 | BORST ET AL. | |
| | Examiner | Art Unit | |
| | Brad T. Mace | 2663 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 April 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Drawings*

1. The drawings were received on April 19, 2002. These drawings are accepted.

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: reference S10 in Figure 3. Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective

action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract exceeds 150 words.

5. The disclosure is objected to because of the following informalities: no reference is made to indicate the start of the description for Figure 4 on pg. 8. The word “lowest” should be placed before “interference”, and the word “levels” should be placed after “interference” on line 23 of pg. 6. Appropriate correction is required.

***Claim Objections***

6. Claim 28 is objected to because of the following informalities: claim 28 should be dependent upon claim 19, not claim 1, on pg. 18. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1-28 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,298,081 ("Almgren et al.").

Regarding claims 1, 9:

9. Almgren et al. discloses a method for channel (frequency) hopping in a time division multiple access radio (wireless) communication system (lines 13-20, col. 1). Almgren et al. discloses first measuring, for at least one time slot (must be idle, otherwise time slot is currently being occupied and cannot be used) or for available channels (frequencies), channel quality parameter (interference) for a first period at a first rate on available communication frequencies in a coverage area (lines 51-63, col. 11, lines 4-7, col. 12, lines 14-24, col. 12, and lines 51-55, col. 6). Almgren et al. discloses forming a first list of frequencies from the available communication frequencies based on the first interference measurements (lines 64-67, col. 5 through lines 1-10, col. 6). Almgren et al. discloses second measuring, for the time slot (must be idle, otherwise time slot is currently being occupied and cannot be used), interference for a second period at a second rate on the frequencies in the first list (the second measurement of interference on the first list is the same as the measurement of interference of available frequencies since the first list comprises entirely of the available frequencies; the second rate can be inferred as the same as the first rate; and

is measured at different time intervals (periods) (lines 51-55, col. 6). Almgren et al. discloses determining an interference level requirement for a call associated with a time slot (since the interference level of channel hopping sequences (containing time slots) can exceed a predetermined value for call quality, this infers the determination of an interference level requirement) (lines 61-67, col. 21 through line 1, col. 22). Almgren et al. discloses selecting frequencies from the first list meeting the interference level requirement based on the second interference measurements during the associated time slot (the channel hopping sequences, containing time slots, are derived from the channel list, lines 4-15, col. 6, and are chosen if they do not exceed an interference level, lines 61-67, col. 21 through line 1, col. 22, based on second interference measurements of the associated channel (containing time slots), lines 51-55, col. 6). Almgren et al. discloses performing channel (frequency) hopping for the call using the selected frequencies (lines 16-19, col. 6).

Regarding claims 2, 12:

10. Almgren et al. discloses that the quality of the channels included in a channel hopping sequence is determined at the different time intervals (periods). (Thus the second period can be less than the first period and it can be inferred that the second rate is different from the first rate, where the second rate can be greater than the first rate in order to obtain "improved accuracy in the observation of channel quality"). (lines 51-55, col. 6).

Regarding claims 3, 13:

11. Almgren et al. discloses selecting a number of the available communication frequencies having a determined channel quality parameter (lowest interference), the number being a predetermined number. (Since there are a finite number of available channels, and since "only the best channels with respect to the channel quality parameter are used", then only a predetermined number of available channels meeting the channel quality parameter are needed.) (lines 58-67, col. 5 through lines 1-15, col. 6).

Regarding claims 4, 14:

12. Almgren et al. discloses that the C/I ratio is another channel quality parameter that may be measured (determined) with respect to frequency (lines 17-23, col. 12). Since the C/I ratio is another parameter that can be measured in addition to interference, it applies to the same procedures of determining interference for each frequency in the first list based on the second interference measurements (and during the associated time slot) as described above. Also, since C/I is being measured, it is based on the measured carrier power. It is inherent that to obtain the C/I ratio, measurement of the carrier power of a call is needed. In addition, since C/I is used in place of interference, selection of each channel (frequency) in the channel list (first list) is based on having a C/I ratio greater than or equal to a desired C/I ratio associated with the call, in the same manner as the interference parameter that was described above.

Regarding claims 5, 15:

13. Almgren et al. discloses that the C/I ratio is another parameter that can be measured (lines 17-23, col. 12). Since the C/I ratio is used in place of interference, the

desired C/I ratio is a predetermined minimum C/I ratio for the call, in the same manner as interference as described above for determining an interference level requirement.

Regarding claims 6, 16:

14. Almgren et al. discloses the measurement of the C/I ratio (lines 17-23, col. 12). It is inherent that to obtain the C/I ratio, measurement of the carrier power of a call is needed. In addition, it is inherent that the measurement of the carrier power is performed during call set-up or call handoff, otherwise the channel hopping sequence from the first list needed for channel (frequency) hopping cannot be compiled, since the C/I ratio cannot be determined without the carrier power.

Regarding claims 7, 8, 17, 18:

15. Almgren et al. discloses dividing the frequencies in the first list into a predetermined number of groups based on the second interference measurements (during the associated time slot) (since the channel hopping sequence is determined at different time intervals with new measurements of channel quality (interference), lines 51-55, col. 6, second channel quality (interference) measurements can be used to divide the channels (frequencies) in the channel (first) list to channel hopping sequences (groups) for respective sequence intervals (lines 7-10, col. 6)). Almgren et al. discloses the measurement of the C/I ratio (lines 17-23, col. 12). It is inherent that to obtain the C/I ratio, measurement of the carrier power of a call is needed. Since the C/I ratio is another parameter that can be measured in addition to interference, it applies to the same procedures of determining interference for each channel (frequency) in the channel hopping sequence (group) from the first list based on the second interference

measurements as described above. In the creation of a channel hopping sequence, "only the best channels with respect to the channel quality parameter", such as C/I, "are used", lines 14-15, col. 6. Thus there exists a C/I ratio range for each group based on the C/I selectivity of the channel hopping sequences derived from the channel list. Also, since C/I is being measured, it is based on the measured carrier power. In addition, selection of each channel hopping sequence (group) in the channel list (first list) is based on having a C/I ratio range greater than or equal to a desired C/I ratio associated with the call, in the same manner as the selection of each channel (frequency) having a C/I ratio greater than or equal to a desired C/I ratio as described above. Therefore, multiple groups can be selected should the C/I ratio range requirements be meet, or only one group can be selected should it be the only group that meets the C/I ratio range requirement.

Regarding claim 10:

16. Almgren et al. discloses second measuring, for the time slot (must be idle, otherwise time slot is currently being occupied and cannot be used), interference for a second period at a second rate on the frequencies in the first list (the second measurement of interference on the first list is the same as the measurement of interference of available frequencies since the first list comprises entirely of the available frequencies; the second rate can be inferred as the same as the first rate; and is measured at different time intervals (periods) (lines 51-55, col. 6). Since the second measuring step can make second measurements for an idle time slot, the second measurement can be made for each idle time slot.

Regarding claim 11:

17. Almgren et al. discloses first measuring, for at least one time slot (must be idle, otherwise time slot is currently being occupied and cannot be used) or for available channels (frequencies), channel quality parameter (interference) for a first period at a first rate on available communication frequencies in a coverage area (lines 51-63, col. 11, lines 4-7, col. 12, lines 14-24, col. 12, and lines 51-55, col. 6). Since the first measuring step can make first measurements of time slots, this must occur during a frame, which can contain only a certain (predetermined) number of time slots.

Regarding claim 19:

18. Almgren et al. discloses a method for channel (frequency) hopping in a time division multiple access radio (wireless) communication system (lines 13-20, col. 1). Almgren et al. discloses first measuring, for at least one time slot (must be idle, otherwise time slot is currently being occupied and cannot be used) or for available channels (frequencies), channel quality parameter (interference) for a first period at a first rate on available communication frequencies in a coverage area (lines 51-63, col. 11, lines 4-7, col. 12, lines 14-24, col. 12, and lines 51-55, col. 6). Almgren et al. discloses forming a first list of frequencies from the available communication frequencies based on the first interference measurements (lines 64-67, col. 5 through lines 1-10, col. 6). Almgren et al. discloses second measuring, for the time slot (must be idle, otherwise time slot is currently being occupied and cannot be used), interference for a second period at a second rate on the frequencies in the first list (the second measurement of interference on the first list is the same as the measurement of

interference of available frequencies since the first list comprises entirely of the available frequencies; the second rate can be inferred as the same as the first rate; and is measured at different time intervals (periods) (lines 51-55, col. 6). Almgren et al. discloses forming, for each idle time slot, a second list of the frequencies in the first list that is order according to the second interference measurements for the time slot (since the channel hopping sequence is determined at different time intervals with new measurements of channel quality (interference), lines 51-55, col. 6, second channel quality (interference) measurements order the second list of frequencies according to the second interference measurements for the time slot) (also see Figure 3b, references 305a-c (first list) and 307a-c (an ordered second list). Almgren et al. discloses forming a composite second list from the second lists (the channel hopping sequences (composite second list) are created from the second (ordered) lists, see Figure 3b, references 307a-c and 220). Almgren et al. discloses determining an interference level requirement for a call associated with a time slot (since the interference level of channel hopping sequences (containing time slots) can exceed a predetermined value for call quality, this infers the determination of an interference level requirement) (lines 61-67, col. 21 through line 1, col. 22). Almgren et al. discloses selecting frequencies from the composite second list (channel hopping sequence, lines 64-67, col. 10 through lines 1-4, col. 11 and Figure 3b) meeting the interference level requirement based on the second interference measurements during the associated time slot (the channel hopping sequences, containing time slots, are derived from the channel list, lines 4-15, col. 6, and are chosen if they do not exceed an interference level, lines 61-67, col. 21

through line 1, col. 22, based on second interference measurements of the associated channel (containing time slots), lines 51-55, col. 6). Almgren et al. discloses performing channel (frequency) hopping for the call using the selected frequencies (lines 16-19, col. 6).

Regarding claim 20:

19. Almgren et al. discloses forming a composite second list, selecting a number of available communication frequencies from each second list having a determined channel quality parameter (lowest interference), the number being a predetermined number. (Since there are a finite number of available channels, and since "only the best channels with respect to the channel quality parameter are used", then only a predetermined number of available channels meeting the channel quality parameter are needed.) (lines 58-67, col. 5 through lines 1-15, col. 6, lines 64-67, col. 10 through lines 1-4, col. 11 and Figure 3b).

Regarding claim 21:

20. Almgren et al. discloses first measuring, for at least one time slot (must be idle, otherwise time slot is currently being occupied and cannot be used) or for available channels (frequencies), channel quality parameter (interference) for a first period at a first rate on available communication frequencies in a coverage area (lines 51-63, col. 11, lines 4-7, col. 12, lines 14-24, col. 12, and lines 51-55, col. 6). Since the first measuring step can make first measurements of time slots, this must occur during a frame, which can contain only a certain (predetermined) number of time slots.

Regarding claim 22:

21. Almgren et al. discloses that the quality of the channels included in a channel hopping sequence is determined at the different time intervals (periods). (Thus the second period can be less than the first period and it can be inferred that the second rate is different from the first rate, where the second rate can be greater than the first rate in order to obtain "improved accuracy in the observation of channel quality"). (lines 51-55, col. 6).

Regarding claim 23:

22. Almgren et al. discloses selecting a number of the available communication frequencies having a determined channel quality parameter (lowest interference), the number being a predetermined number. (Since there are a finite number of available channels, and since "only the best channels with respect to the channel quality parameter are used", then only a predetermined number of available channels meeting the channel quality parameter are needed.) (lines 58-67, col. 5 through lines 1-15, col. 6).

Regarding claim 24:

23. Almgren et al. discloses that the C/I ratio is another channel quality parameter that may be measured (determined) with respect to frequency (lines 17-23, col. 12). Since the C/I ratio is another parameter that can be measured in addition to interference, it applies to the same procedures of determining interference for each frequency in the composite second list based on the second interference measurements (and during the associated time slot) as described above. Also, since C/I is being measured, it is based on the measured carrier power. It is inherent that to obtain the C/I

ratio, measurement of the carrier power of a call is needed. In addition, since C/I is used in place of interference, selection of each channel (frequency) in the composite second list is based on having a C/I ratio greater than or equal to a desired C/I ratio associated with the call, in the same manner as the interference parameter that was described above.

Regarding claim 25:

24. Almgren et al. discloses that the C/I ratio is another parameter that can be measured (lines 17-23, col. 12). Since the C/I ratio is used in place of interference, the desired C/I ratio is a predetermined minimum C/I ratio for the call, in the same manner as interference as described above for determining an interference level requirement.

Regarding claim 26:

25. Almgren et al. discloses the measurement of the C/I ratio (lines 17-23, col. 12). It is inherent that to obtain the C/I ratio, measurement of the carrier power of a call is needed. In addition, it is inherent that the measurement of the carrier power is performed during call set-up or call handoff, otherwise the channel hopping sequence from the first list needed for channel (frequency) hopping cannot be compiled, since the C/I ratio cannot be determined without the carrier power.

Regarding claims 27, 28:

26. Almgren et al. discloses dividing the frequencies in the composite second list into a predetermined number of groups based on the second interference measurements (lines 64-67, col. 10 through lines 1-4, col. 11 and Figure 3b) (since the channel hopping sequence is determined at different time intervals with new measurements of channel

quality (interference), lines 51-55, col. 6, second channel quality (interference) measurements can be used to divide the channels (frequencies) in the second list to channel hopping sequences (groups) for respective sequence intervals (lines 7-10, col. 6)). Almgren et al. discloses the measurement of the C/I ratio (lines 17-23, col. 12). It is inherent that to obtain the C/I ratio, measurement of the carrier power of a call is needed. Since the C/I ratio is another parameter that can be measured in addition to interference, it applies to the same procedures of determining interference for each channel (frequency) in the channel hopping sequence (group) from the second list based on the second interference measurements as described above. In the creation of a channel hopping sequence, "only the best channels with respect to the channel quality parameter", such as C/I, "are used", lines 14-15, col. 6. Thus there exists a C/I ratio range for each group based on the C/I selectivity of the channel hopping sequences derived from the channel list. Also, since C/I is being measured, it is based on the measured carrier power. In addition, selection of each channel hopping sequence (group) in the second list is based on having a C/I ratio range greater than or equal to a desired C/I ratio associated with the call, in the same manner as the selection of each channel (frequency) having a C/I ratio greater than or equal to a desired C/I ratio as described above. Therefore, multiple groups can be selected should the C/I ratio range requirements be meet, or only one group can be selected should it be the only group that meets the C/I ratio range requirement.

***Conclusion***

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

*Ugland et al. discloses frequency and channel hopping communication in a TDMA cellular mobile radio system

*Anderson et al. discloses a method and means for frequency hopping in a radio communication system

*Chang et al. discloses a dynamic channel assignment

*Ishikawa et al. discloses a mobile communication system with autonomous distributed type dynamic channel allocation scheme

*Dent discloses a time-reuse partitioning system and methods for cellular radio telephone systems

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brad T. Mace whose telephone number is (703)-306-5454. The examiner can normally be reached on M-F, with the exception of every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on (703)-305-4798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

btm

Brad T. Mace
Examiner
Art Unit 2663

btm
June 22, 2004

RICKY NGO
PRIMARY EXAMINER